



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

Applicant : Jangbarwala  
Serial No. : 10/658,079  
Filed : September 9, 2003  
Title : APPLICATION OF CONDUCTIVE ADSORBENTS, ACTIVATED  
CARBON GRANULES AND CARBON FIBERS AS SUBSTRATES IN  
CATALYSIS  
Docket : 434830-00002  
Examiner : Lois L. Zheng  
Art Unit : 1742

Commissioner for Patents  
Post Office Box 1450  
Alexandria, VA 22313-1450

Sir:

**DECLARATION OF TERRY K. BAKER  
UNDER 37 C.F.R. § 1.132**

I, Terry K. Baker, declare and state the following:

1. I was granted a Ph.D. in 1966 and a D.Sc. in 1978, both from the University of Wales, United Kingdom.
2. I was employed as a Senior Research Associate working on the fundamentals of heterogeneous catalysis at the Corporate Research Labs of Exxon R & E Co., Clinton, New Jersey from 1975 to 1986.
3. I was a Professor in the Department of Chemical Engineering at Auburn University from 1986 to 1992, a Professor in the Department of Materials at The Pennsylvania State University from 1992 to 1996 and a Professor in the Department of Chemistry at Northeastern University in Boston, MA from 1996 to 2001.

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4. I am currently the Vice President for Research for Catalytic Materials LLC in Holliston, MA.
5. I was awarded the Charles E. Pettinos Award, American Carbon Society (1988); the Pittsburgh-Cleveland Catalysis Award (1995); the Catalysis Society of Metropolitan New York Award (1998) and made a Fellow of the American Carbon Society, 1999.
6. I have authored six books and more than 285 publications in the field of catalysis and carbon materials.
7. I am an inventor of thirty-six (36) United States patents.
8. I have conducted extensive research in the areas of carbonaceous materials including carbon fibers, carbon nanofibers and carbon nanotubes, hydrocarbon catalysis and metal-support interactions.
9. I am familiar with the generation of hydrogen using supported metal catalyst systems.
10. I have read and understand the Office action mailed on September 15, 2005 including the rejections pursuant to 35 U.S.C. § 112.
11. I have read and understand the subject matter of the above-referenced patent application as originally filed on September 9, 2003.
12. Upon reading the originally filed patent application, it is apparent that the specification teaches the concept of performing a chemical reaction in the presence of a catalyst,

wherein the catalyst, while being supported on an electrically conductive carbonaceous material, is heated, by way of resistive heating, to a temperature substantially and disproportionately higher than the temperature of the support.

13. At p.3, ¶ 9 of the present application, Applicant describes how the conductive support passes an electric current to the catalyst to “locally activate the catalyst.” I understand “locally activate” to mean the catalyst is resistively heated to a disproportionately higher temperature than the support. Furthermore, p.3, ¶ 9 refers to heat being “generated at the site of the catalyst.” This clearly suggests that the catalyst is being disproportionately heated relative to the support.

14. An inevitable result of applying an electric current to a conductive carbonaceous support having a catalyst dispersed therein (or thereon) is a disproportionate heating of the catalyst with respect to the support (i.e., the temperature of the catalyst substantially increases with respect to the support).

15. Example 2 on p. 14 of the present application discloses a Copper/Zinc/Aluminum catalyst coated onto a carbon cloth (i.e., an electrically conductive carbonaceous support). A DC power supply was connected to the carbon cloth, thereby passing an electric current through the carbon cloth and to the Cu/Zn/Al catalyst. I, like others skilled in the art of catalysis and carbonaceous materials, recognize that, upon initiating the DC power (i.e., the electric current), the temperature of the Cu/Zn/Al catalyst will inevitably increase substantially with respect to the temperature of the carbon cloth, thereby activating the catalyst, while maintaining relatively low reaction temperatures.

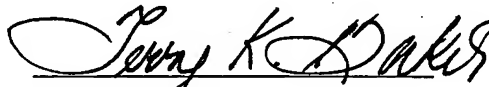
16. Therefore, upon reading the originally filed patent application, those skilled in the art will appreciate that the application discloses a catalytic technique wherein an electric current

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resistively heats a catalyst positioned on a support such that a temperature of the catalyst substantially increases with respect to the support.

17. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 10/10/05

  
Terry K. Baker